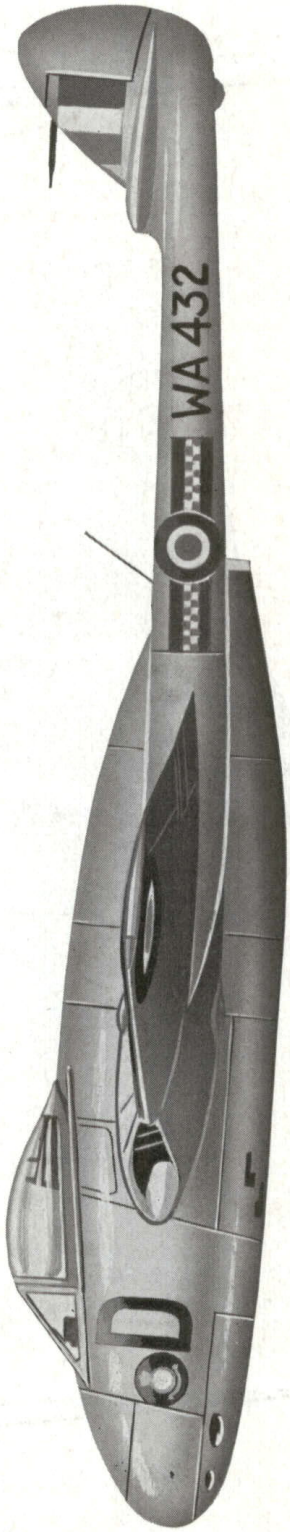
PROFILE PUBLICATIONS

The de Havilland Vampire Mk. 5 & 9



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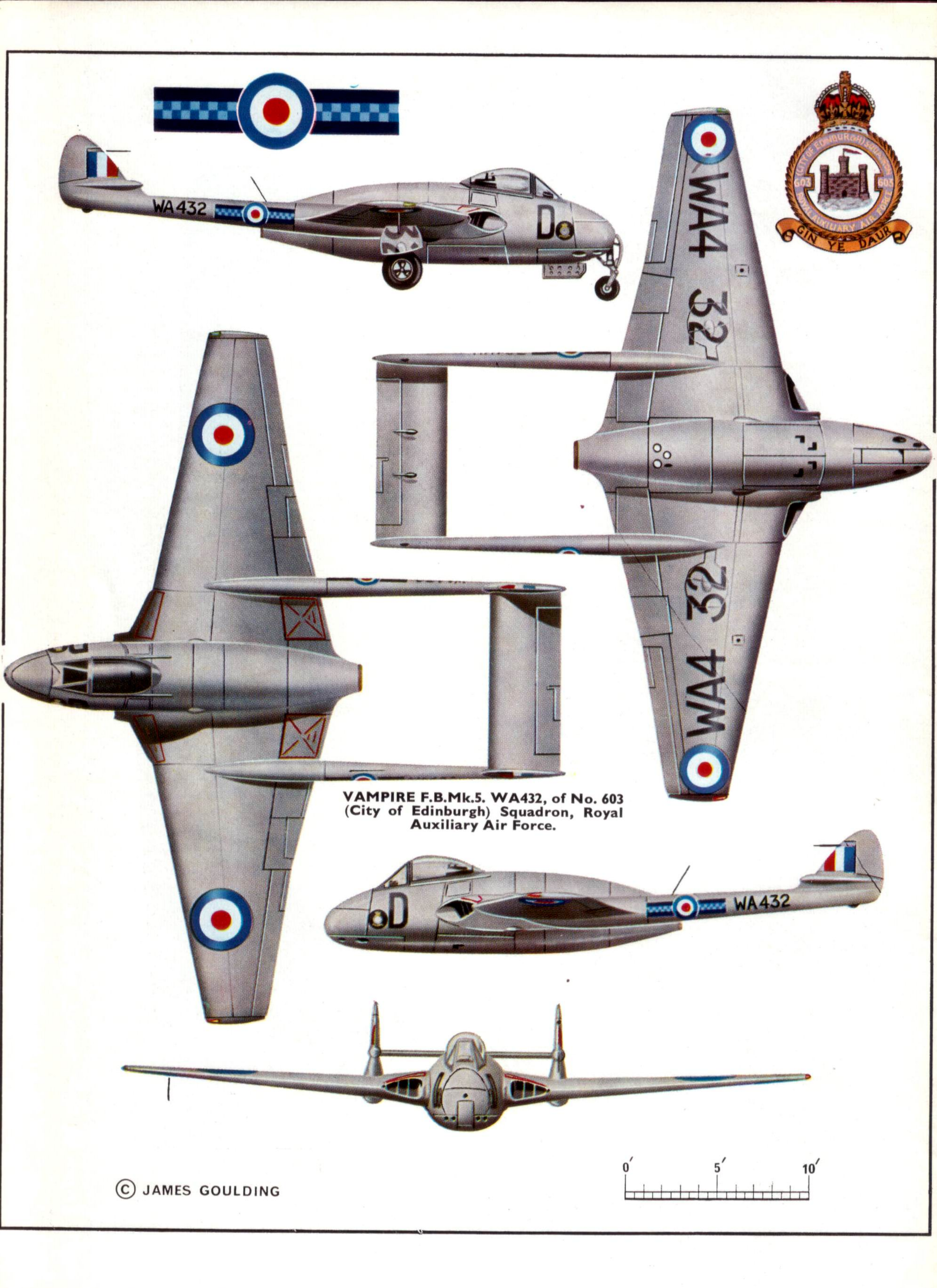

VAMPIRE F.B.Mk.5. WA432, of No. 603 (City of Edinburgh) Squadron, Royal Auxiliary Air Force.

© JAMES GOULDING

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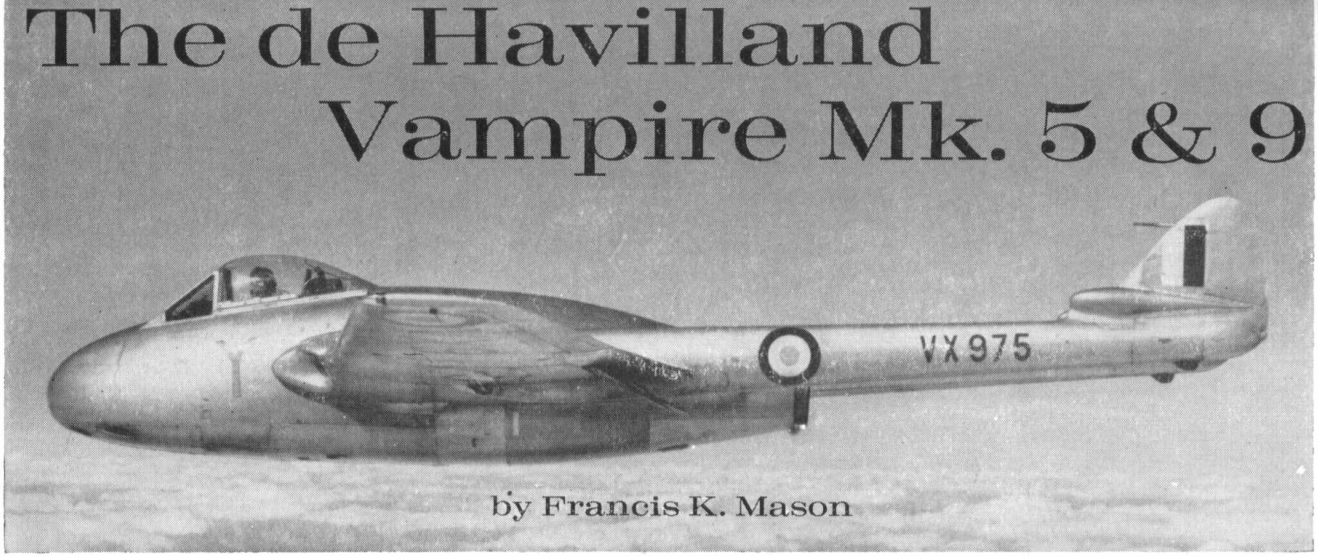
The de Havilland Vampire Mk. 5 & 9



by Francis K. Mason

No. 247 (Fighter) Squadron Vampire F.B.5 flying from Odiham in May 1951. The unit letter on the nose was red with black edging—the Squadron colours. (Photo: via R. Ward)

Fondly referred to by many post-war pilots as the "aerial kiddy car", the Vampire day fighter was certainly the last unsophisticated single-engine front-line aircraft to serve with Britain's Fighter Command. To qualify this distinction, one must first point out that all its flying controls were manually-operated without recourse to or necessity for power assistance. No radar was fitted and the fighter consisted of a simple airframe, "first generation" jet engine, and four 20-mm. Hispano guns aimed by a gyro gunsight. Only the twin boom layout set the Vampire aside as being unconventional among its contemporaries.

Detail design of the de Havilland D.H. 100 Vampire commenced early in 1942 after acceptance of proposals submitted to Air Ministry Specification E.6/41. Though this called for an experimental prototype, provision for gun armament was included in the design from the earliest days, the newly-established four 20-mm. Hispano gun battery being housed in the underside of the fuselage nacelle. Power was supplied by one D.H. Goblin I jet engine which employed a single-sided centrifugal compressor and produced 2,700 pounds thrust.

Construction was composite metal and balsa/ply, the fuselage nacelle continuing the wood application used in the successful Mosquito design which entered R.A.F. service in mid-1942. Three prototypes, *LZ548/G*, *LZ551/G* and *MP838/G* (characterised by tall triangular vertical surfaces generically similar to that of the Mosquito) led the way to a production order for 120 Mark Is being placed on 13th May 1944, and this was later increased to 300. Only about half-a-dozen production aircraft flew before the end of W.W.II, but, unlike so many other wartime British aircraft, production plans for the Vampire survived the post-war axe. Mark Is (with square-topped tail surfaces) entered R.A.F. service in 1946 as pure interceptors and also equipped squadrons of the Second Tactical Air Force in Germany, often replacing wartime generation fighters such as Typhoons, Mustangs and Tempests. On 3rd July 1948 they were the first jet aircraft to enter peacetime service with the Royal Auxiliary Air Force when they replaced Mosquitos on No. 605 (County of Warwick) Squadron.

Vampire Is were also supplied in various versions to Canada, Switzerland and Sweden, and thence by various routes to Austria and the Dominican Republic.

Vampire II was the designation applied to three experimental Nene-powered Vampires, *TG276*, *TG280* and *TX807*, identified by dorsal intakes demanded by the double-sided compressor of the Rolls-Royce engine. The latter aircraft was shipped out to Australia where (as *A78-2*) it performed much of the development work for the subsequent Nene-powered Vampire F.Mk.30.

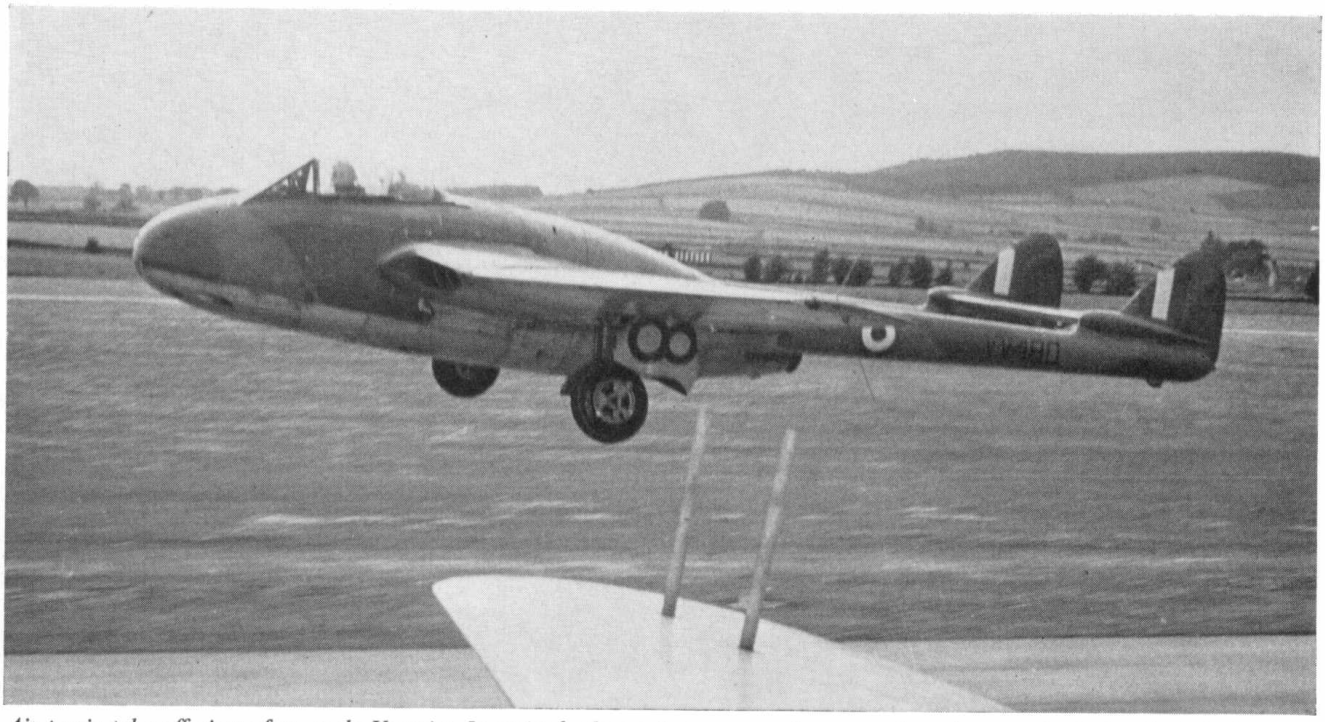
The Vampire III represented an attempt to increase the effectiveness of the design in the environment of increased radar warning range, anticipated shortly after the end of the war. The first-generation jet fighter was widely characterised by a chronic lack of range, in the case of the Vampire I only about 700 statute miles. The early Vampires had used Mosquito-type underwing slipper tanks, but the Mark III introduced wing tankage and provision for 100- or 200-gallon drop tanks. Developed to Spec. F.3/47, the Vampire 3 (so designated after the change to arabic numerals) entered R.A.F. service late in 1947 and remained with the R. Aux. A.F. until well into the nineteen-fifties. The type was also characterised by alterations to the tail unit: the tailplane was lowered and the vertical surfaces were changed to conform more nearly to the well-known de Havilland outline.

The Vampire 3 made history when six aircraft of No. 54 (Fighter) Squadron became the first British jet aircraft to cross the Atlantic, refuelling in Iceland. Greenland and Labrador.

Re-design of the Vampire wing to accommodate pylon-mounted drop tanks inevitably led to the carriage of other stores and hence adaptation of the design for ground-attack duties. With low-level performance of prime importance, the wing span was reduced by two feet so that the wing tips were square cut (trials with this wing were carried out on Vampire I, *TG444*), and the provision of strongpoints for bombs and rockets was accompanied by greater strength factors and thicker wing skinning. The increased wing loading in turn resulted in greater sinking speeds on landing and this demanded undercarriage legs of increased travel. Thus was evolved the Vampire F.B.Mark 5.

THE VAMPIRE 5

The first production Vampire F.B.5 flew on 23rd June 1948 and by the end of the year was replacing Vampire 3s in Fighter Command. Next they started to replace Mosquitos in R.A.F. Squadrons in Germany and later joined Mark 3s in service with the



Air-to-air take-off view of an early Vampire 5; mainwheels are just commencing retraction, the nosewheel already locked up and covered.

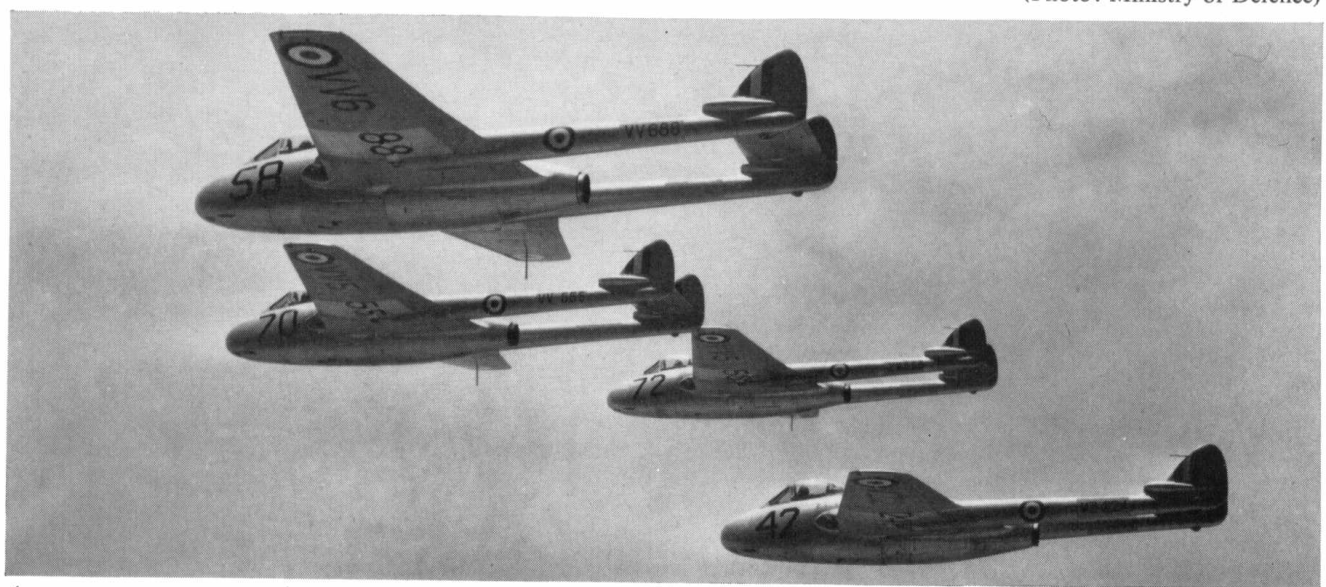
R. Aux. A.F. It was however in Germany that the Vampire served in the largest numbers for, with the increased tension following the Berlin Airlift and with a war being fought in Korea, the R.A.F. faced increased responsibilties in Europe. By 1954 Vampire 5s had served with or were serving on Nos. 3, 4, 5, 11, 16, 20, 26, 67, 71, 93, 94, 118, 145, 234 and 266 (Fighter) Squadrons of the 2nd Tactical Air Force.

At home, Vampires served in Nos. 11 and 12 Groups in the south of England with Nos. 54 and 247 (Fighter) Squadrons at Odiham, and also Nos. 72 and 130 Squadrons. With the Auxiliaries, they served on Nos. 501, 502, 601, 602, 603, 604, 605, 607, 608, 609, 612, 613 and 614, and were still serving on these Squadrons when the R. Aux. A.F. was disbanded in 1957.

The Vampire 5 also served in the Middle and Far East, and it was in the latter area that their weapons were discharged in anger. No. 32 (Fighter) Squadron had operated Vampire 3s from Nicosia since 1949, and carried out tropical trials with the type; in January 1951 the Squadron moved to Shallufa and converted to Mark 5s. The month previously No. 60 Squadron, based at Tengah, Singapore, took delivery of Vampire 5s and very soon the new aircraft were in action against the terrorists at large in the jungle, using their rockets and bombs to good effect.

By 1953 the Vampire was becoming outdated in the Regular Air Force at home. (At the same time the Meteor 8 only managed to remain relatively effective by the addition of spring tabs and other minor improvements.) On being replaced by Meteor 8s, Vampire 5s were relegated to Flying Training Command, serving with Advanced Flying Schools Operational Conversion Units and the School of Air Armament.

One of many Vampire 5 formation teams, this group was flown by instructors from R.A.F. Swinderby during the mid 1950's.
(Photo: Ministry of Defence)



A No. 6 Squadron Vampire 5 raising the dust on take-off during air exercises in Jordan in 1950. No. 6 Squadron was at that time normally based in the Suez Canal Zone.

THE VAMPIRE 9

Experience with Vampire 3s and 5s in tropical climates during 1949-51 illustrated the need to provide the pilots with refrigeration equipment. The result was the inclusion of a Godfrey refrigerator unit in the starboard wing intake fillet, resulting in the fillet being extended about eight inches forward.

At the same time it had also been demonstrated that the performance of jet aircraft suffered in the high ambient temperatures of the tropics, and experience with Vampires exported to tropical countries had engendered the development of the uprated Goblin 3 which, with dual fuel booster pumps, developed 3,500 pounds thrust. This engine was also adopted in the Vampire F.B.Mk.9.

The first Vampire 9s to go into R.A.F. service overseas were ferried out by pilots of R.A.F. Transport Command to Nos. 28 and 60 Squadrons in the Far East during January 1952 where they gradually replaced F.B.5s.

Shortly afterwards Vampire 9s equipped the Middle East Squadrons, Nos. 6, 8, 32, 73, 213 and 249 based at Nicosia, Shallufa, Habbaniyah, Khormaksar and in the Suez Canal Zone. Aircraft of No. 8 Squadron, based in Kenya, took part in the prolonged policing operations against the Mau Mau terrorists.

With the introduction of the Venom F.B.1 during 1954 and 1955, the Vampire 9s were brought home and joined earlier versions on training units.

In its day the Vampire was an excellent transitional training aircraft. In service with Operational Conversion Units at Valley in Anglesey, and Chivenor, North Devon, they were used to "convert" pilots from the North American Harvard to operational fighters such as the Gloster Meteor 8 and North American Sabre. They were also used to convert night fighter pilots from Mosquitos to the Vampire 10.

Among jet fighters, they were forgiving aeroplanes. During an air gunnery sortie from Chivenor a pilot returned to base with the target flag wedged in his starboard air intake. Another pilot, misjudging his approach to the Chivenor runway, undershot and rubbed the Vampire's belly on a threshold sand dune; realising his wheels were still retracted, he opened up and went round for a conventional landing. A more senior officer had a disconcerting experience during take-off when, just before unstick, the control column fouled his dinghy pack between his legs, causing the

The "weathercocking" action by 3-inch rockets well demonstrated by a Vampire 5 of the 2nd Tactical Air Force during air-to-ground firing practice.

A No. 8 Squadron Vampire 9 taking-off from R.A.F. Khormaksar, Aden.

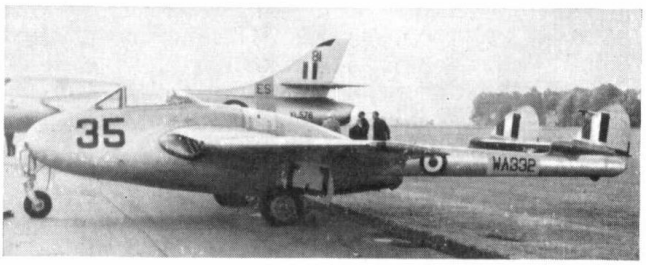
dinghy to inflate; faced with rapidly diminishing living space, the pilot drew his revolver and blew a hole in the offending dinghy. Unfortunately he also holed his foot! Thereafter many R.A.F. pilots carried small knives sewn into the sleeves of their flying overalls.

Perhaps the luckiest escape from a Vampire 5 was that of Plt. Off. Roger Dimmock who, flying as No. 2 on a low-level flight over the Irish Sea, accidentally touched the water and immediately flamed-out. Performing the inevitable ditching was an act of instant self-preservation, but the aircraft promptly dived under the surface and came to rest on the sea bed about 30 feet down; quickly releasing his harness and hood, Dimmock shot to the surface in the cockpit air bubble.

THE VAMPIRE AT SEA

Ever since Lt.-Cdr. E. M. Brown, R.N.V.R., had performed the first-ever deck landings and take-offs by a pure-jet aircraft in the third Vampire prototype on H.M.S. *Ocean* on 3rd December 1945, the Admiralty maintained a close interest in the Vampire as a possible standard naval fighter. That this never came about was not so much the fault of the aircraft as the opinion that carrier operations were not sufficiently flexible to allow combat application of jet aircraft at sea. On the one hand deck handling techniques did not lend themselves to the disruption caused by jet blasts, and on the other the critically short range and endurance of early jet fighters created a navigational burden upon the pilot such that the interceptor could only be regarded as "fleet top cover".

When the Air Ministry issued a specification covering the Vampire 5 with increased range in 1947, the Admiralty ordered 18 examples with which to intro-



Above: *A Vampire F.B.5, WA 332, of No. 7 F.T.S., based at Valley, Anglesey.*

Left: *This No. 60 Squadron Vampire 9 demonstrates the characteristic "torching" effect during engine flight at night.*

Echelon formation of No. 8 Squadron Vampire 9s in flight near Aden in 1954.

duce jet operating techniques to operational pilots and deck crews. Honours for the first British jet fighter to reach operational status however fell to the Supermarine Attacker.

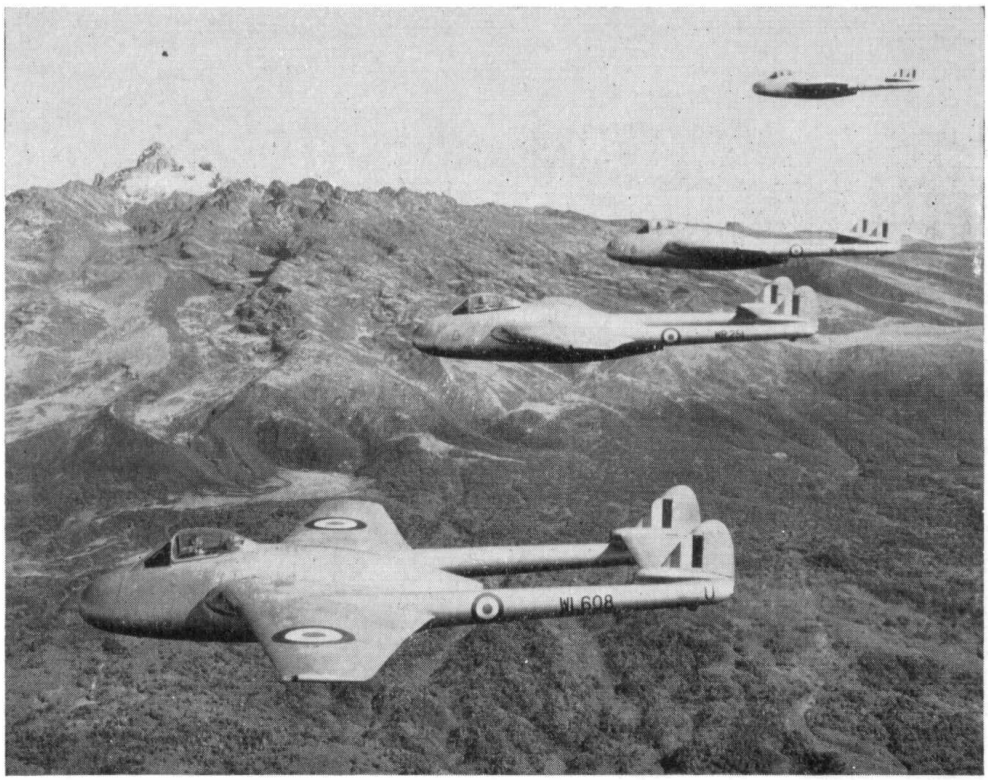
First of the naval Vampires to fly—designated Sea Vampire F.20—was *VV136*, on 15th October 1948. Production machines were delivered to No. 700 Squadron at Ford and No. 702 Squadron at Culdrose, and also to No. 787 Squadron, replacing de Havilland Sea Hornets. During the course of deck trials Lieutenants G. Baldwin, D.S.C., and K. Shepherd of the Carrier Trials Unit performed more than two hundred landings at sea.

The Sea Vampire was distinguishable from the R.A.F. version in being equipped with a Vee-frame arrester hook installed *over* the engine jet pipe, so that when lowering it passed through the jet flow. Air brakes and landing flaps were enlarged to give better low speed control for the approach to the deck, and load factors were increased to cater for greater deck landing loads.

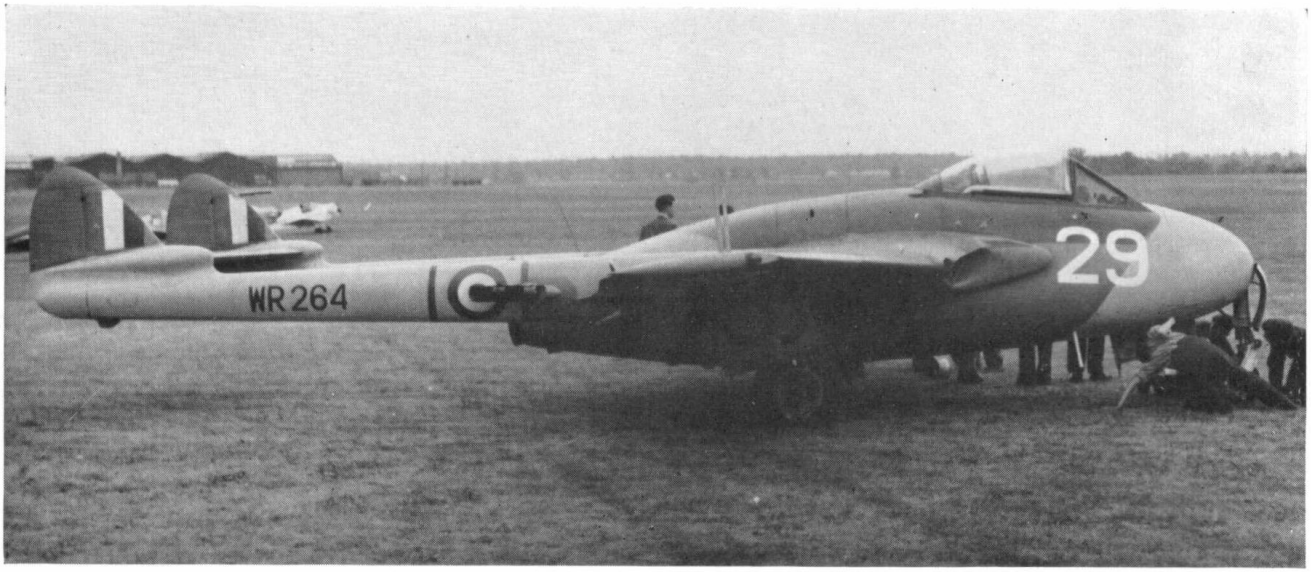
A development was the Sea Vampire F.21, of which three examples were produced, and this was used both at the Royal Aircraft Establishment, Farnborough, and on H.M.S. *Warrior* for undercarriage-less landings. With strengthened undersides the aircraft were flown on to rubberised deck surfaces with wheels retracted, the purpose being principally to accelerate deck handling simply by bodily manhandling the fighter out of the path of following aircraft.

VAMPIRES FOR EXPORT

Though not strictly akin to the Vampire 5, the Australian Nene-powered Vampire F.B.31 was developed from the Mark 3 through the Australian F.30 by modifications equivalent to those of the R.A.F.'s F.B.5. Eighty Vampire 30s were built, of which 29



No. 8 Squadron Vampire 9s on patrol over Mau Mau territory during the operations of the early 1950s.
(Photo: Ministry of Defence)



Fairey-built Vampire F.B.9, WR 264, *of the Royal Air Force College.*

became Mk. 31s. One other was converted to the Mark 32 which in effect corresponded to the R.A.F. Mk. 9 with cockpit conditioning added.

The principal export variant was the Vampire 6, powered by the Goblin 3. One hundred Mark 6s were licence built in Switzerland by a consortium comprising the Federal Aircraft Plant at Emmen, Pilatus and Flug und Fahrzeugwerke A.G.

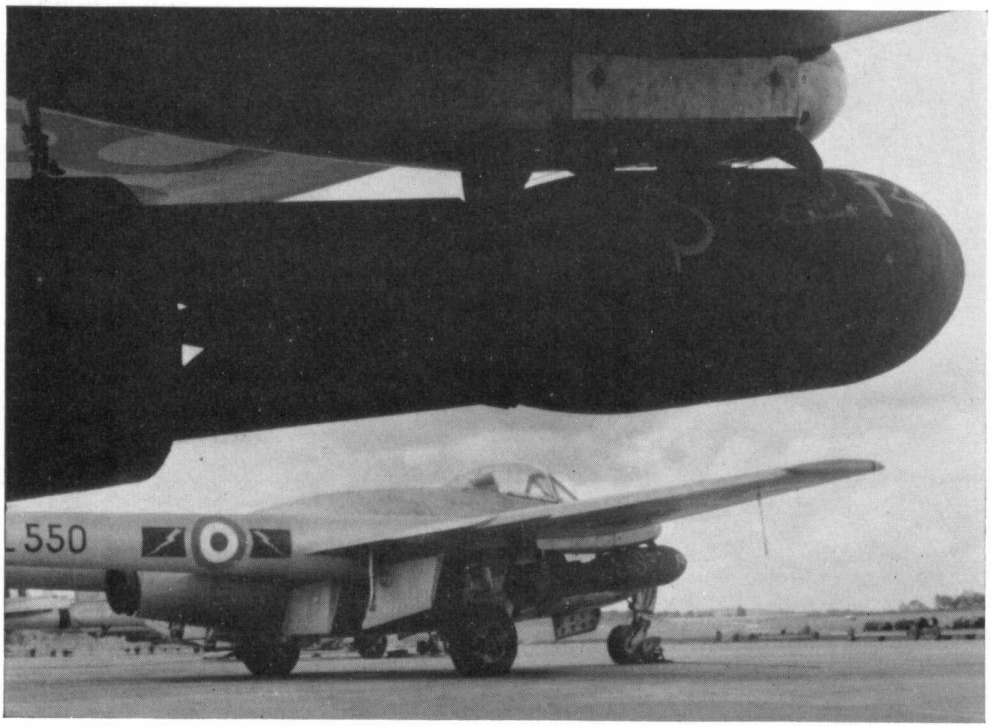
Sweden ordered the Vampire F.B.50 based on the Mk. 5, while the Goblin 3-powered F.B.52 was sold to Finland, Norway, Egypt, Iraq, Lebanon and Venezuela. twelve standard Mark 5s were diverted to the Indian Air Force and 27 went to the South African Air Force. Overseas licence production included 80 F.B. Mk. 52As produced by Macchi and Fiat in Italy, and 67 standard Mark 5s assembled in France by S.N.C.A. du Sud-Est.

At the time of writing some Vampires are still airworthy in Venezuela, Finland and the Lebanon.

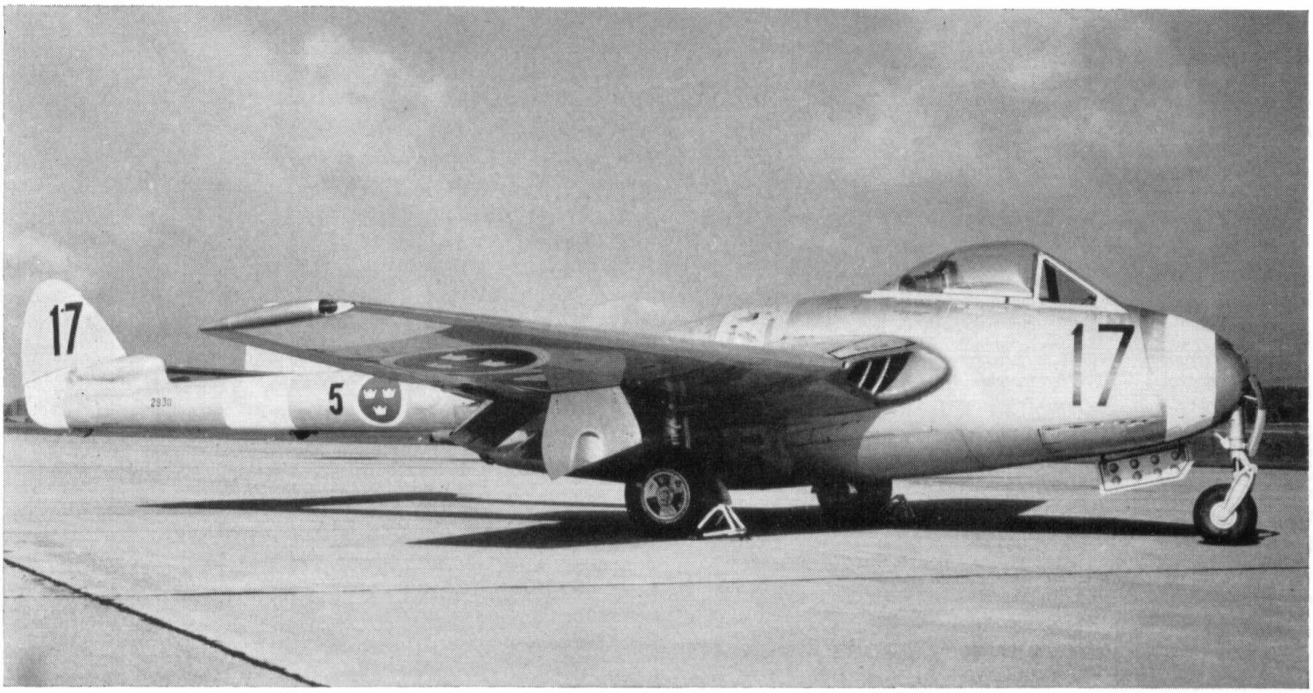
FLYING THE VAMPIRE

Undoubtedly the outstanding feature of the Vampire's handling characteristics was its incredible lightness and sensitivity of control. Ailerons were finely balanced and high rates of roll were possible though reversal was startling in its onset. The elevator was also highly effective and large accelerations resulted from relatively slight movements of the control column. On the other hand the rudders, on account of their small area, demanded coarse movement to be of much consequence.

Take-off. So simple were the Vampire's systems that only six take-off Vital Actions were necessary: trim neutral, high and low pressure fuel cocks "on", booster pump "on", flaps selected as required and air brakes "in". When flown clean, acceleration on take-off was sprightly and the aircraft could be lifted from the runway at about 110 knots. When carrying drop

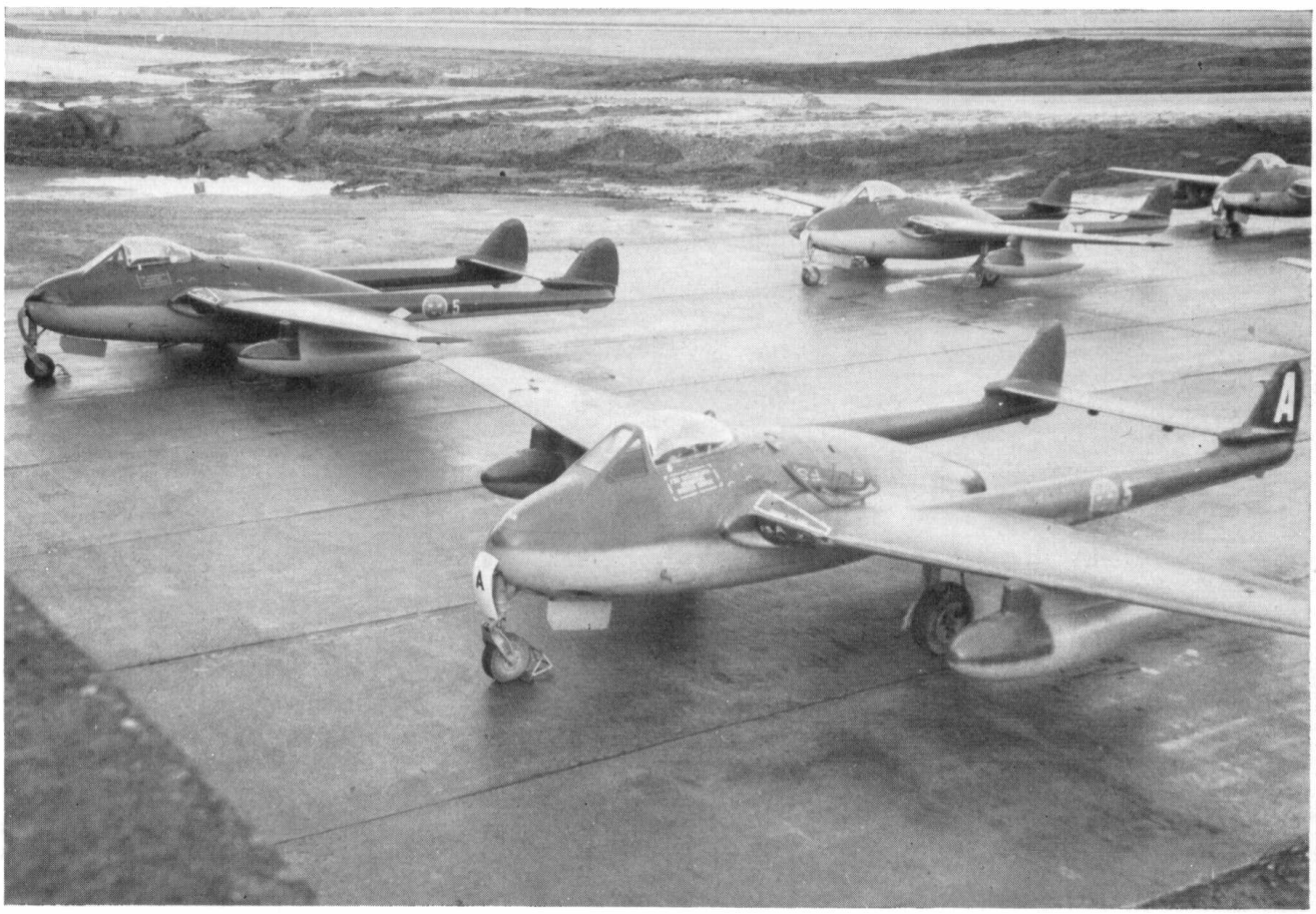


Underwing 500-lb. bombs on Vampire F.B.9s of No. 60 Squadron, Tengah, Singapore. (Photo: via D. Ward)



J28B Vampire of V.5 in natural metal finish. Numerals were painted black and panels were of orange-red dayglow. The Wings equipped with Vampires were F.8, F.9, F.15 and F.18. (Photo: Bo Widfeldt)

Swedish Vampires allocated to F.5 of the Swedish Air Force (full unit markings not yet completed). (Photo: Bo Widfeldt)



tanks or bombs it was necessary to retract the wheels quickly otherwise the airflow between the stores and wheel fairings would build up and cause the doors to stay open. As no nosewheel brake was included, the still-rotating nosewheel entering its recess immediately below the pilot often caused so much noise and vibration that the uninitiated momentarily anticipated instant catastrophe.

In the air. Engine handling took some getting used to. Pilots experienced in piston engine handling had to learn to anticipate speed demands earlier as the power response from the Goblin was considerably slower, and any rapid throttle movement might cause engine surge, flame out or, at worst, a burst compressor.

Due to the relatively good power/weight ratio of the single-seat Vampire, the aeroplane was tremendously manoeuvrable within the 400-500 m.p.h. speed range. At lower speeds, however, steep turns required coarse use of rudder to maintain height, and it was uncomfortably simple to stall in relatively shallow turns. The stall was likely to be accompanied by quite sharp wing-drop, but a surprising amount of aileron control existed right down to the stall, albeit with marked control buffet. One was advised to recover quickly while use of the most effective elevator could be maintained. Though by no means dangerous, the spin could be embarrassing owing to blanking of the diminutive rudders and the necessity to use coarse elevator control resulted in the aircraft pointing at *terra firma* for an uncomfortable length of time while speed built up!

Aerobatics in the Vampire were sheer joy and were strangely akin to those of light sporting aircraft, apart, of course, from the airspeed and amount of sky used. With judicious engine handling, the Vampire was the last British jet fighter to be capable of accurately precipitated hammer stalls, stall turns and wingovers.

At the upper end of the speed range, the Vampire behaved in singular fashion with the onset of compressibility, and from M=0·71 up to 0·76 the aircraft displayed increasing porpoising and wing buffet until at M0·79 the aircraft would suddenly "break" up or down with the likelihood of a wing drop, giving the sensation of an "incipient" flick roll. Recovery from high Mach runs was simple with use of the air brakes, though below 250 knots these were of little real value.

Should a flame-out occur in flight, a forced landing was unavoidable as no re-light system was provided. Ditching was not recommended and, if over water, the pilot was advised to vacate his cockpit.

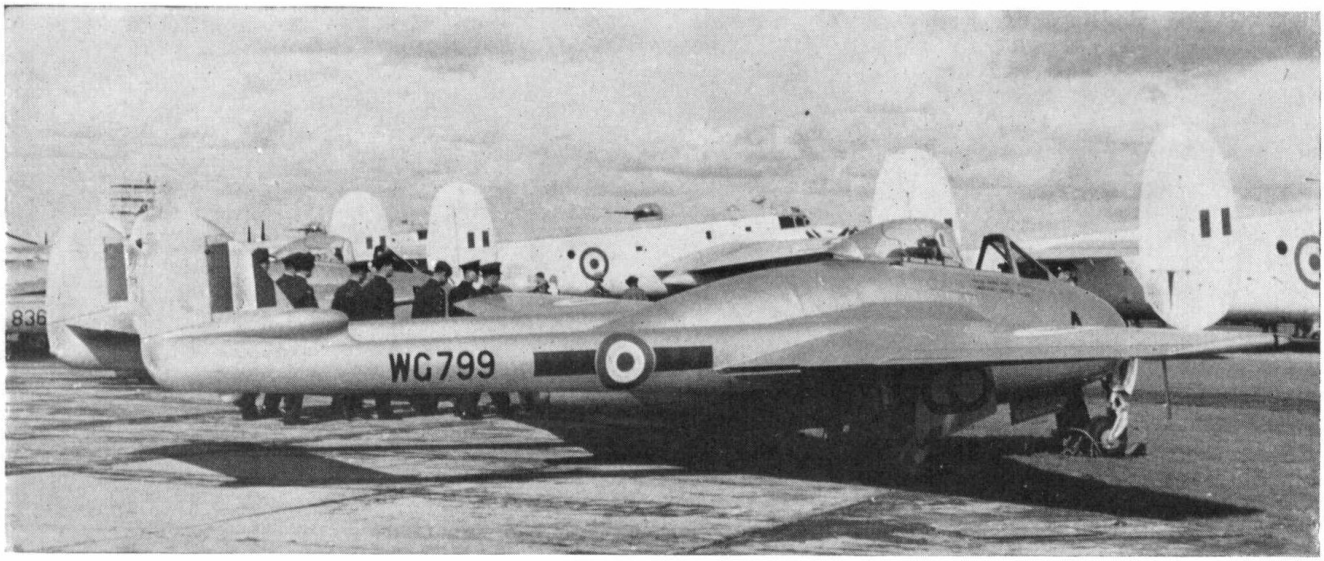
Landing. Landing vital actions, like those for take-off, were minimal: wheel brakes checked off, landing gear indicated down (three green lights), flaps fully down on final approach, and air brakes in. After turning on to the final approach at about 105 knots, speed was reduced so as to cross the runway threshold at about 95. Stall with gear down and power on would occur at little above 75 knots, so that touchdown would be aimed at at about 10-15 knots above this when landing without stores. Owing to the sluggish engine response, power-on approaches were recommended in order to obtain quicker acceleration in the event of a go-round. The low landing weight meant that wheel locking could easily occur when using the brakes, and careful braking was necessary if constant tyre replacement was to be avoided! Anti-skid devices were not fitted.

The cockpit. By later standards, the cockpit was distinctly untidy. The fuel gauges were virtually invisible without moving the control column back! And then some mental arithmetic was required to tot up the fuel remaining in the various tanks. Although not required in flight (except in the event of a forced landing), movement of the low pressure fuel cock demanded double-jointed fingers as the lever was carefully concealed behind the throttle! Despite these shortcomings, view from the cockpit was superlative, and this together with the small size of the Vampire contributed to a feeling of being an integral part of a delightfully sensitive flying machine.

VAMPIRE 5 PRODUCTION

Manufacture by English Electric Co. Ltd., Samlesbury:
VV214–VV232, VV443–VV490, VV525–VV569, VV600–VV611, VV614–VV640, VV655–VV700, VV717–VV736; 220 aircraft, of which *VV718, VV720–VV723, VV725–VV736* were diverted to the Indian Air Force.
VX461–VX464, VX471–VX476, VX950–VX990, VZ105–VZ155, VZ161–VZ197, VZ206–VZ241, VZ251–VZ290, VZ300–VZ359;

Later production Vampire 5 of No. 614 Squadron, Royal Auxiliary Air Force.



Vampire F.B. Mk. 5, No. 112 (Fighter) Squadron,
2nd TAF, Fassburg, Germany.

No. 112 Squadron.

Vampire F.B. Mk. 9, No. 60 (Fighter) Squadron,
Tengah, Singapore.

No. 60 Squadron.

Vampire F.B. Mk. 5, Italian Air Force.

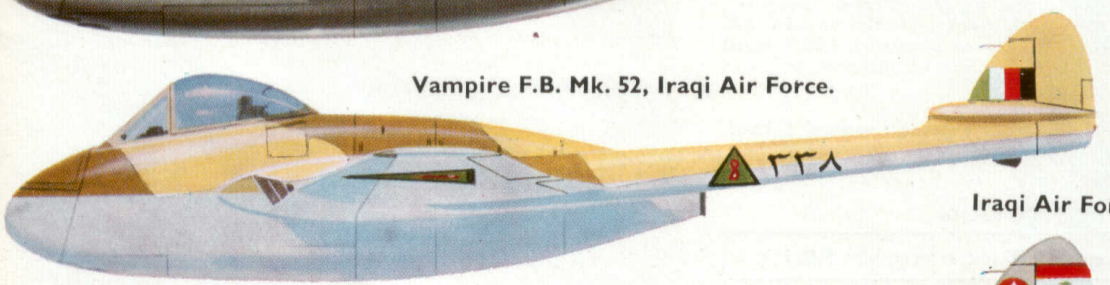
J 28B Vampire, F5, Swedish Air Force.

Swedish Air Force.

Vampire F.B. Mk. 5, Venezuelan Air Force.

Venezuelan Air Force.

Vampire F.B. Mk. 52, Iraqi Air Force.

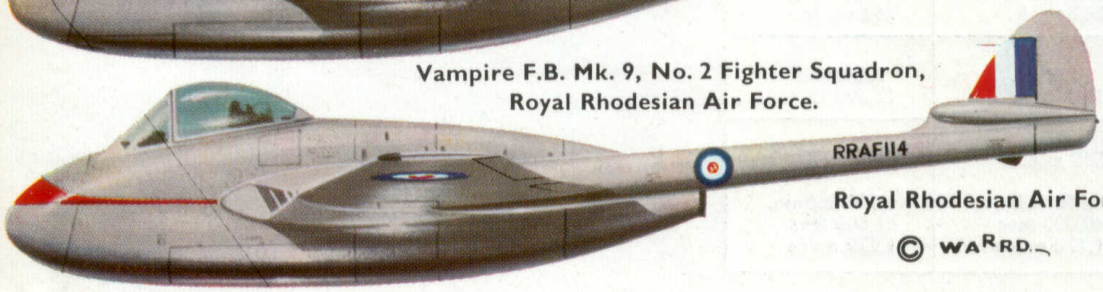


Iraqi Air Force.

Vampire F.B. Mk. 52, Lebanese Air Force.

Lebanese Air Force.

Vampire F.B. Mk. 9, No. 2 Fighter Squadron,
Royal Rhodesian Air Force.



Royal Rhodesian Air Force.

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275 aircraft, of which *VZ252–VZ256* were transferred to the Italian Air Force and became *MM6000–MM6004*. *WA101–WA150, WA159–WA208, WA215–WA264, WA271–WA320, WA329–WA348, WA355–WA403, WA411–WA460, WE830–WE849;* 339 aircraft.
WG832–WG847; 16 aircraft.
Total English Electric production: 850 aircraft.
Manufacture by de Havilland Aircraft Co. Ltd., Hatfield and Broughton.
VZ808–VZ852, VZ860–VZ877; 63 aircraft, of which *VZ810, VZ814, VZ817* and *VZ820* were transferred to the French Air Force.
WG793–WG807, WG826–WG831; 21 aircraft.
A78–1 to *A78–41;* 41 aircraft for the Royal Australian Air Force.
NZ5721–NZ5738, NZ5750–NZ5778; 47 aircraft for the Royal New Zealand Air Force.
201–210, 248–254; 27 aircraft for the South African Air Force.
Total de Havilland production: 299 aircraft.
(*Note:* Some of the above aircraft were transferred to the Egyptian and Venezuelan Air Forces).

VAMPIRE 9 PRODUCTION

Manufactured by de Havilland Aircraft Co. Ltd.
WG848–WG851, WG865–WG892, WG922–WG931, WL493–WL518, WL547–WL587, WL602–WL616, WP990–WP999, WR102–WR111, WR114–WR158, WR171–WR204; 223 aircraft.
26 aircraft in batches between *WX200* and *WX260:* of the above aircraft 15 were transferred to the Royal Rhodesian Air Force (becoming *101–115*) and 10 to Jordan (becoming *F–600* to *F–609*). Two additional aircraft, *CF510* and *CF511*, were built for Ceylon.
Total de Havilland production: 251 aircraft.
Manufactured by the Fairey Aviation Co. Ltd., Ringway.
WR205–WR215, WR230–WR269: 51 aircraft.

SERVICE ALLOCATION

R.A.F. Units equipped with Vampire F.B.5s and F.B.9s.
Fighter Command (1st line equipment) Nos. 54, 72, 130 and 247 (Fighter) Squadrons.
Fighter Command (2nd line equipment) Nos. 23, 25, 29 and 151 (Fighter) Squadrons (night fighter squadrons).
Advanced Flying Schools at Valley and Western Zoyland.
Flying Training Schools: No. 1, Linton-on-Ouse; No. 4, Worksop; No. 5, Oakington; No. 7, Valley; No. 8, Swinderby.
Operational Conversion Unit, Chivenor.
2nd Tactical Air Force, Germany (1st line equipment): Nos. 3, 4, 5, 11, 16, 20, 26, 67, 71, 93, 94, 118, 145, 234 and 266 (Fighter) Squadrons.
Middle East (1st line equipment): Nos. 6, 8, 32, 73, 213 and 249 (Fighter) Squadrons.
Far East (1st line equipment): Nos. 28 and 60 (Fighter) Squadrons.
Royal Auxiliary Air Force: Nos. 501 (County of Gloucester), 502 (Ulster), 601 (County of London), 602 (City of Glasgow), 603 (City of Edinburgh), 604 (County of Middlesex), 605 (County of Warwick), 607 (County of Durham), 608 (North Riding), 609 (West Riding), 613 (City of Manchester), 614 (County of Glamorgan).
Central Flying School.
Central Fighter Establishment (Day Fighter Leaders' School, Air Fighting Development Squadron).

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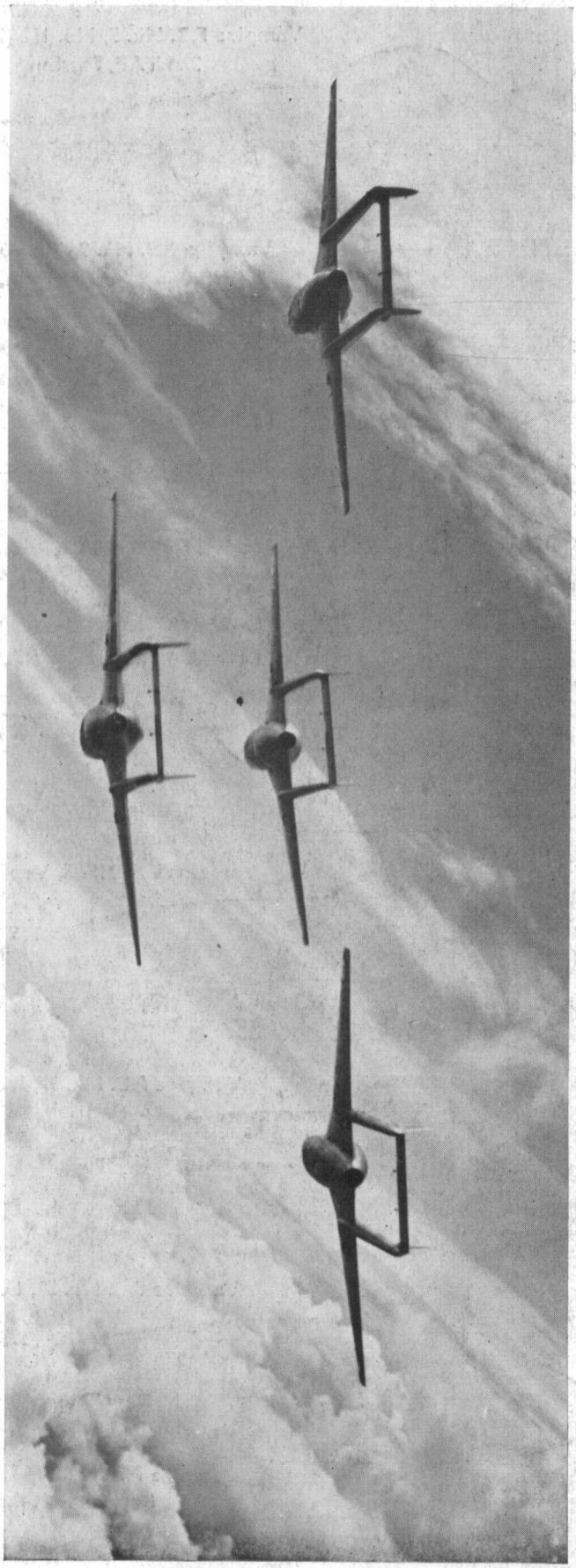
SPECIFICATION

	Vampire F.B. Mk. 5	Vampire F.B. Mk. 9
Powerplant	3,100 lb. s.t. de Havilland Goblin 2	3,350 lb. s.t. de Havilland Goblin 3
Dimensions		
Span	38 ft. 0 in.	38 ft. 0 in.
Length	30 ft. 9 in.	30 ft. 9 in.
Height	8 ft. 10 in.	8 ft. 10 in.
Wing Area	262 sq. ft.	262 sq. ft.
Weights		
Tare	7,253 lb.	7,283 lb.
All-up	12,360 lb.	12,390 lb.
Performance		
Max. Speed	535 m.p.h.	548 m.p.h.
Initial climb rate	4,050 ft./min.	4,800 ft./min.
Combat ceiling	40,000 feet	42,800 feet
Combat range	1,170 miles	1,220 miles



Vampire 5 aerobatic team from the Merryfield Advanced Flying School. (Photo: Ministry of Defence)

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